FOREST INSECT LABORATORY
Berkeley, California

February 10, 1949

To: F. P. Keen, In Charge, Berkeley California

From: J. E. Patterson, Entomologist

Subject: Toxic-oil Spray Demonstration Project-Julian Area

In setting up certain specifications for this project reference is made to your memorandum "Entomological Work Plan for the Julian-Pine Hills-Cuyamaca Control Project" dated November 22, 1948.

In consideration of the requirements in connection with this proposed demonstration of oil-spray treatment of infested trees on selected areas of the control project the following techniques, basic materials and supplies, are required and listed. The amounts given are based on the treatment of about 100 infested trees. This number is believed to be sufficient to demonstrate the effectiveness of the treatment and is probably the maximum number available for the particular requirements of this method of control.

It is proposed to spray the infested trees in standing position and without any preliminary treatment other than spotting by survey crews. The sprays will be applied in the form of a light surface film entirely covering the bole from the ground to a height equal to the extent of main bole infestation. In these short trees about 30 feet in height. Sprays to be applied by means of a gasoline powered sprayer of conventional type. It is understood that the State Division of Forestry has available at least one sprayer of this type. Time of spraying will be determined by activity of the infesting beetles. Sprays should be applied before any emergence occurs from the overwintered brood trees; probably during the period from March 15 to April 15. It is presumed that control surveys will be completed and all infested trees marked for treatment prior to spraying activities. Each spraying crew should consist of

four men exclusive of the technical advisor. One truck deiver for the spray rig; two nozzle men; and one truck driver with pickup truck to supply the sprayer with sprays compounded at the mixing base. Trees will be sprayed from the ground by the nozzleman walking around the tree at the same time keeping the spray stream impinged on the infested portion of the trunk. Application of spray will be limited to an amount reaching the threshold of run-off.

Sprayers should be capable of maintaining a working pressure of 300 pounds, or more. They should have tank capacity of 50 gallons, or more, and two line hose at least 50 feet in length. Line pressure loss is considerable with standard 1 inch hose, therefore to maintain nozzle pressure of 300 pounds requires pump pressures of between 350 and 400 pounds. Each sprayer should be equipped with two nozzles capable of delivering a narrow stream to a tree height of 30-40 feet. A complete sprayer unit should be mounted on, or carried in, a truck capable of negoitating the infested terrain.

Analyses of sprayed stocks are requisite to determine success of the sprays. The most practical way to obtain these data is to cage sections of sparyed trees and sections of unsprayed trees. A comparison of emerged beetles from these sections should give the answer to amount of control secured by spraying. Facilities for carrying out these analyses can be provided by selecting a suitable site in the control area, preferably in the infested stands. A sufficient number of screened cages is necessary. Ten cages should be ample. These should be constructed according to the accompanying sketches.

Protection ofworkers from spray and application hazards are explained in detail in the Working Plan dated November 22, and will not be re-stated here. Cooperation of concerned agencies is also stated in this same memorandum.

Sprays

Oil sprays containing a toxicant are recommended. Only two formulae will be considered for this project; both of veyry simple cpmposition:

Formula 1:

Orthodichlorobenzene	1 part (volume)
Diesel oil*	6 parts (volume)

Formula 2:

DDT, Technical grade	1 pound, weight
Solvent **	½ gallon, volume
Diesel oil*	3 gallons, volume

(*) Fuel oil No. 2 may be substituted
(**) Shell solvent No. 2; or Socal solvent

Approximately 3 gallons per tree will be needed. On this basis the total amount of ingredients will be needed for compounded sprays sufficient to spray 100 infested trees:

Orthodichlorobenzene	25 gallons ✓
DDT, technical grade	60 pounds ✓
Solvent **	30 gallons — 52 gallons on hand.
Diesel oil*	350 gallons

A listing of suppliers of these materials is given in the appendix.

It is presumed that sprayers are in adequate condition for the proposed work. However, trouble incessently arises thru deterioration of gaskets when oil-base sprays are used. Therefore replacement material should be kept on hand. A very resistant material is found in KOROSEAL #117. It is supplied in flat laid sheets about 1/8" thickness; one square yard being the minimum supplied and at a cost of $11.00 postage paid. One square yard should be sufficient for this project and is highly recommended.

Cages: A total of 10 screened cages will be needed to obtain rearing data. These cages should be of wood and mesh screen construction according to specifications on the attached skectches. Due to frequent fluctations in price of the raw stocks specific cost data are not given here. The total cost will approximate $200 for the ten cages.

J. E. Patterson

APPENDIX

Cages:

Specifications: Size for 24" screen - 26" wide X 26" deep X 36" high. Sides and top screened; bottom open. Construction details as per attached sketch.

Materials for 1 cage:

Stock: 2x2" SFS pine	42 L feet
3/4x1/4" SFS pine	42 L feet
Carriage bolts (1/4x4 1/2")	12 pieces
Wing nuts, 1/4"	12 pieces
Washers, 3/8"	12 pieces
Brads, 1"	1 ounce
Casing nails, 12d	1/4 pound
Casing nails, 10d	1/4 pound
Screen, 20 mesh, 24" wide (Plastic or wire)	9 1/2 L feet

Addition: Stock 3/4x3" x 10' = 10 L. ft. pine (for top frames)

If plastic screen is available it is recommended over wire screen because of its lower cost. In addition to the cage materials, platform material for constructing a suitable foundation for the cages is needed. This material will consist of 2x4" stock for framework and 4/4x12" boards for sheathing.

Amount: 4/4x4" pine or fir 16s 10 pieces
4/4x12" pine or fir 16s 6 pieces

These materials are obtainable from any retail lumber dealer.

Spray Materials:

Orthodichlorobenzene: The crude grade is satisfactory and may be obtained from a number of chemical supply houses: The follwing are some examples:

Braun-Knecht-Heiman., 1400-16th Street, San Francisco
Dow Chemical Company, 310 Sansome St. San Francisco
Monsanto Chemical Co., 111 Sutter St. San Francisco
Los Angeles Chemical Co., 1960 Sante Fe Av. Los Angeles
L. H. Butcher Co., 2030 Bay St. Los Angeles
Mefford Chemical Co., 1026 Sant Fe Av. Los Angeles

DDT (dichloro-diphenyl-trichloroethane) May be obtained from many sources, including the following local concerns:

Braun, Knecht-Heiman Co., 1400-16th St. San Francisco
California Spray Chemical Co., Richmond, California
Eston Chemicals, Inc., 3100 E. 26th St. Los Angeles
Griffen Chemical Co., 1000-16th St. San Francisco
Leffingwell Co., P. O. Box 191, Whittier, Calif.
Monsanto Chemical Co., 111 Sutter St. San Francisco
Stauffer Chemical Co., 636 California St. San Francisco

Solvents for DDT:

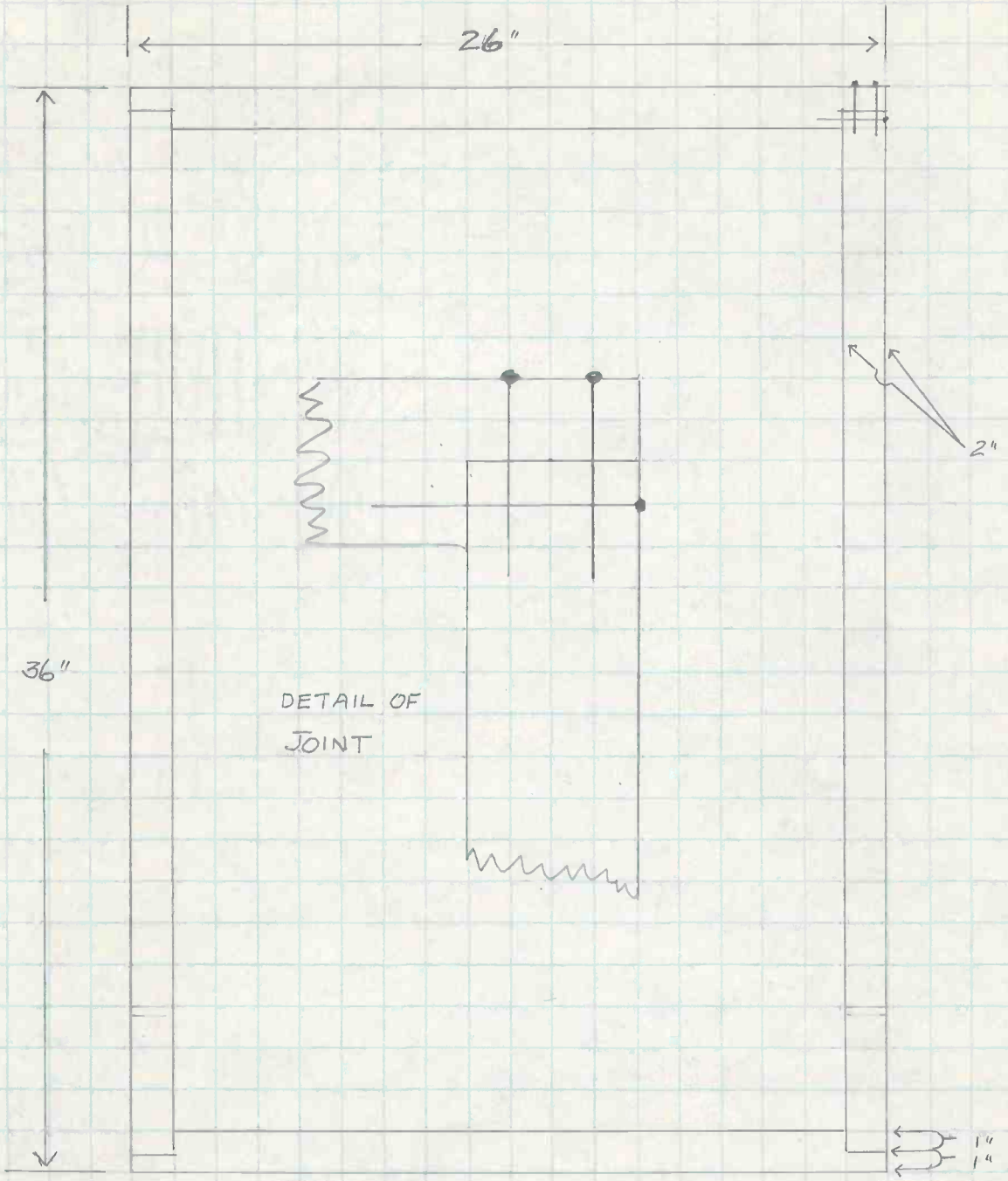
Standard Oil Co., of Calif. "Socal solvent"
Shell Oil Company "Shell solvent #42"
(or other oil companies)

Diesel or Fuel Oil #2:

Obtainable from any oil company.

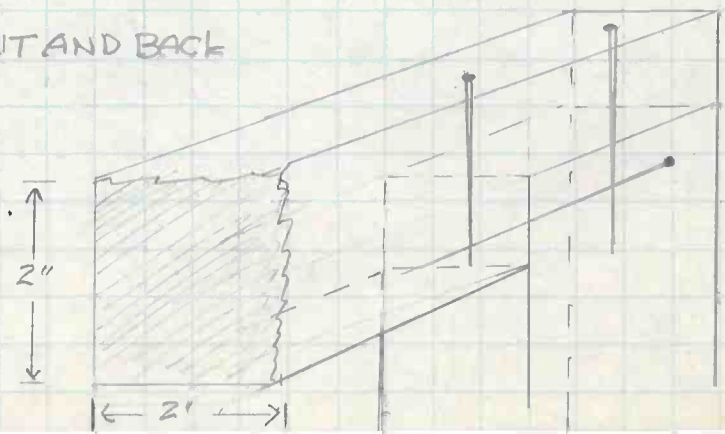
KOROSEAL #117: At the present time this material is obtainable only thru the manufactures agents:

B. F. Goodrich Co., Industrial Products Division,
Att: Mr. J. M. Garvin, 19 Rector Street, New York 6, N. Y.

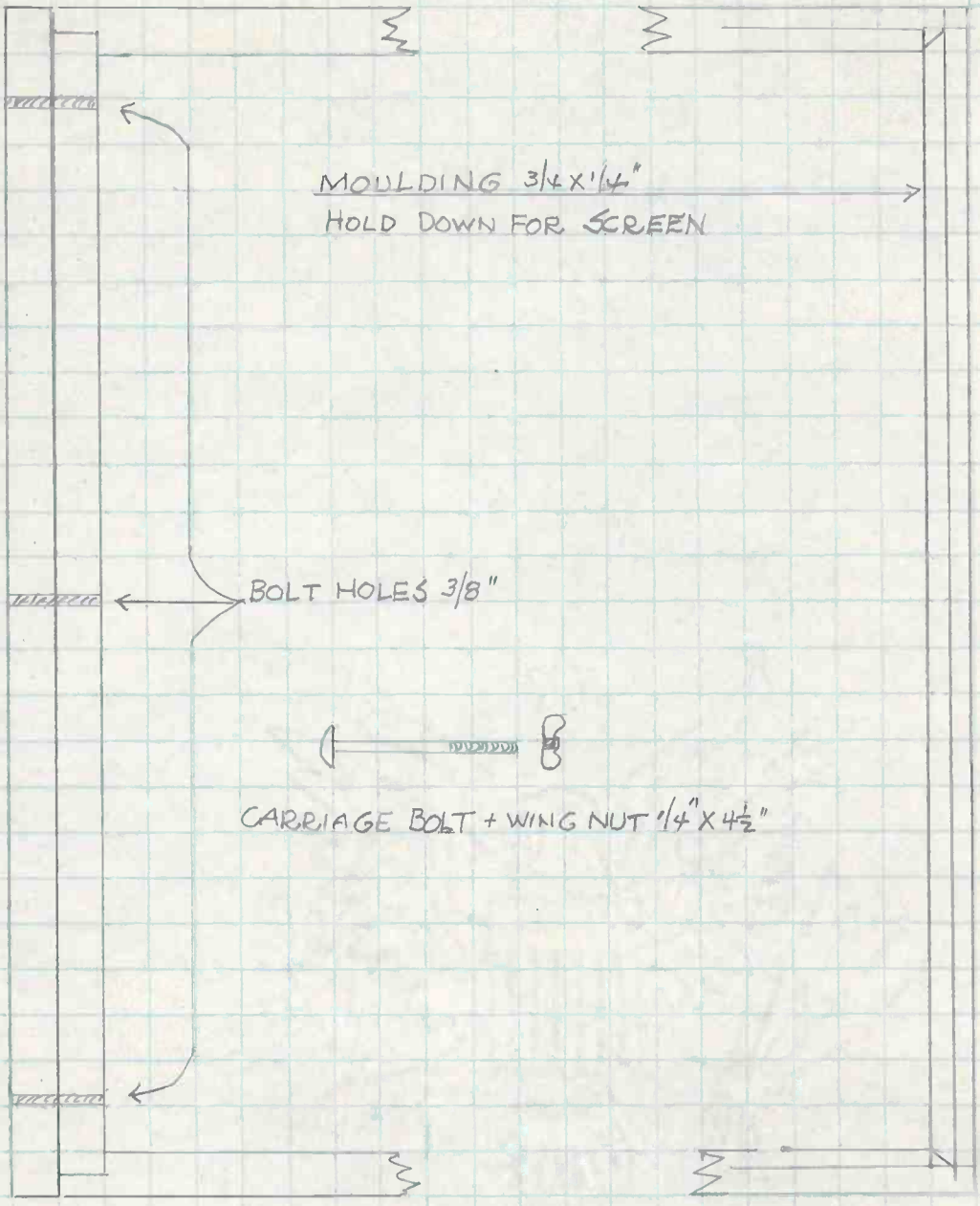


CAGE STILE - FRONT AND BACK

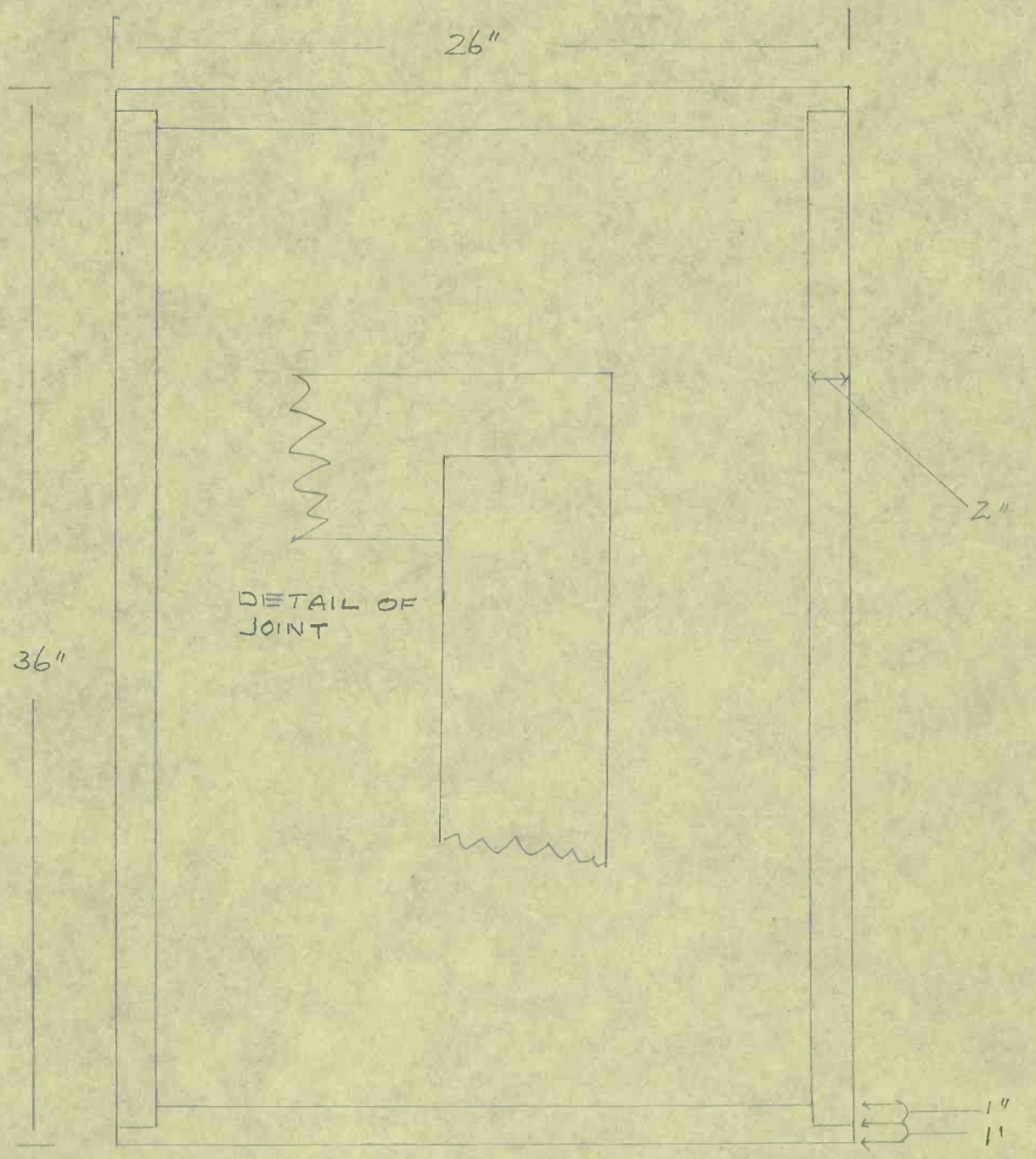
SIDES SAME LESS



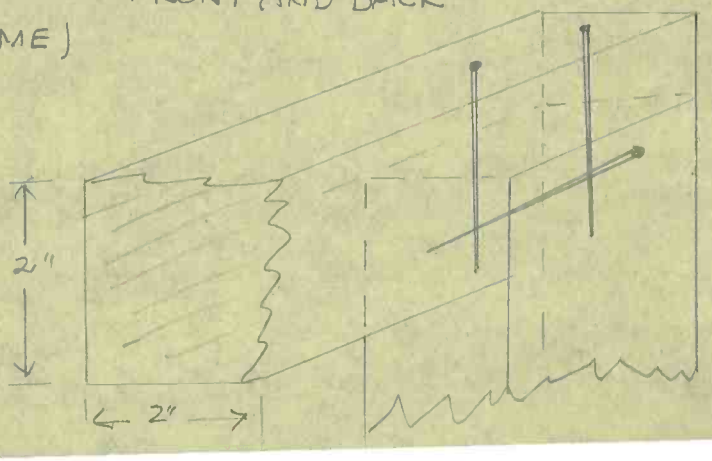
PERSPECTIVE
DETAIL OF
CORNER JOINT



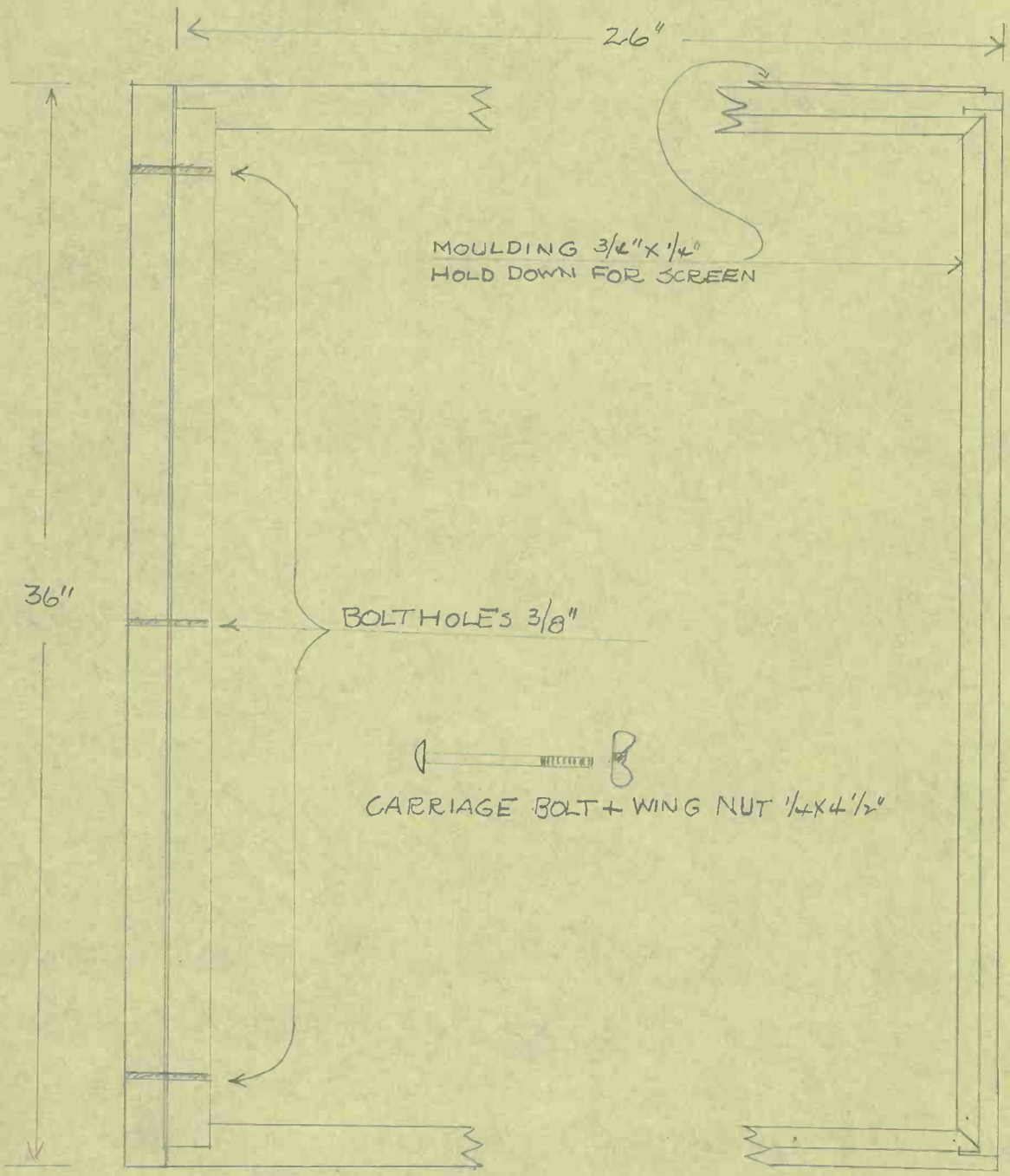
DETAIL SHOWING METHOD OF LOCKING STILES AND FASTENING SCREEN



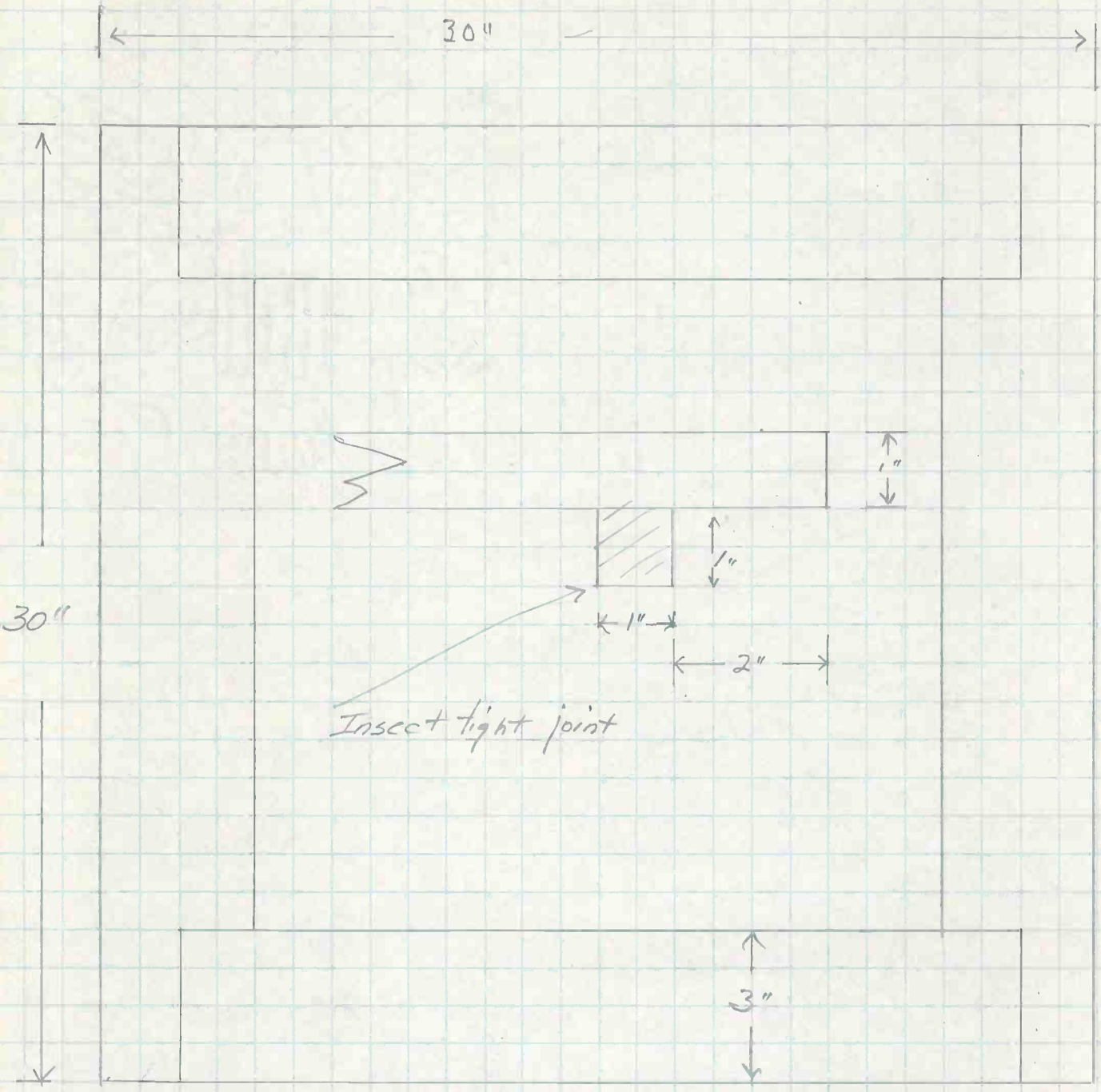
CAGE STILE - FRONT AND BACK
(SIDES SAME)



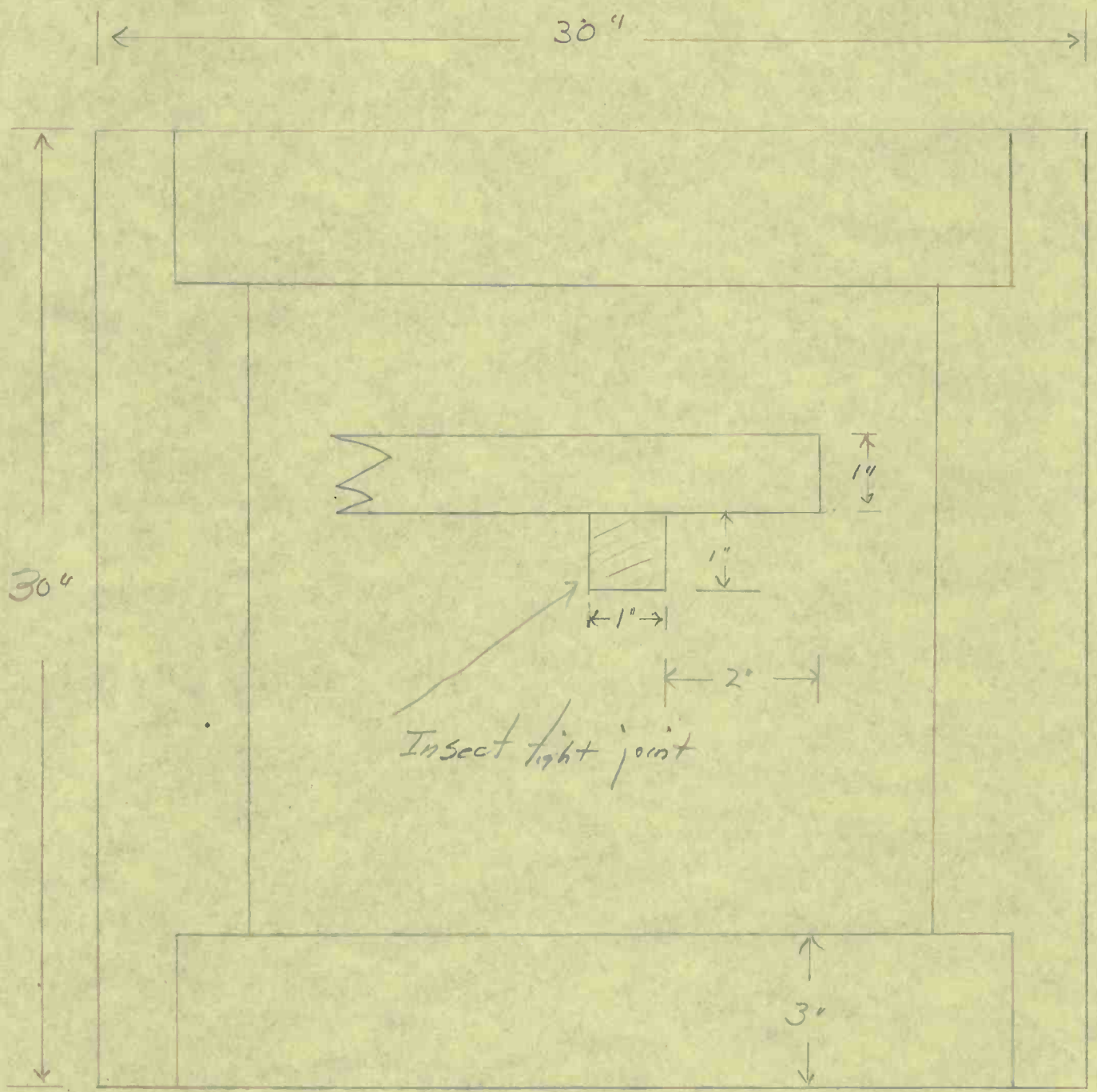
PERSPECTIVE DETAIL OF CORNER JOINT



DETAIL OF CAGE SIDES SHOWING METHOD OF LOCKING STILES AND FASTENING SCREEN



Detail of top rails



Detail of top Rails